FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-2188 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 1 07/26/99

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: MDCA 1	V070-764200
LRU	: MDCA 2	V070-764220
LRU	: MDCA 3	V070-764230
SRU	: DIODE	JANTX1N1188R

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, ISOLATION, 35 AMP - MAIN DC BUS TO ESSENTIAL BUS ISOLATION

REFERENCE DESIGNATORS:
40V76A31CR2
40V76A31CR3
40V76A32CR2
40V76A32CR3
40V76A33CR2
40V76A33CR3

QUANTITY OF LIKE ITEMS: 6
SIX REQUIRED - ONE PER MAIN BUS POWER CIRCUIT

FUNCTION:
ISOLATES EACH MAIN DC BUS FEEDER TO THE ESSSENTIAL BUS FROM THE OTHER POWER SOURCES OF THE ESSENTIAL BUS.

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6-2186- 02

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: MDCA 1, 2, 3 **CRITICALITY OF THIS**
ITEM NAME: DIODE **FAILURE MODE:** 1R3

FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:
PL PRE-LAUNCH
LO LIFT-OFF
OO ON-ORBIT
DO DE-ORBIT
LS LANDING/SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY:
102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

CAUSE:
THERMAL STRESS, CONTAMINATION, STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), ELECTRICAL STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:
A)

B)
"B" SCREEN IS "N/A" BECAUSE FAILURE OF AT LEAST TWO REMAINING PATHS IS READILY DETECTABLE DURING FLIGHT (DIODE SHORT TO STRUCTURE, POWER CONTACTOR, REDUNDANT REACTANT VALVE CLOSURE).

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: 05-6-2186- 02

FIRST FAILURE - NO EFFECT LOSS OF NORMAL ISOLATION

(B) INTERFACING SUBSYSTEM(S):
SAME AS (A)

(C) MISSION:
NO EFFECT - FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE AFTER FOURTH FAILURE (ASSOCIATED FUEL CELL TO MAIN DC BUS POWER CONTACTOR FAILED CLOSED) DUE TO INABILITY TO "SAFE" A FUEL CELL. LOSS OF AN ESSENTIAL BUS (REQUIRES TWO FAILURES ON SAME DIODE - SHORT AND SHORT TO GROUND ON DIODE CR2 OR CR3) RESULTS IN LOSS OF THE ASSOCIATED FUEL CELL COOLANT PUMP AS WELL AS REDUNDANT CONTROL OF THAT FUEL CELL'S REACTANT VALVES. THIS NECESSITATES REMOVAL OF ALL LOAD FROM THE FUEL CELL IN ORDER TO RENDER IT SAFE. INABILITY TO REDUNDANTLY CLOSE REACTANT VALVES OR REMOVE THE BUS LOAD FROM THE FUEL CELL UNDER THESE CIRCUMSTANCES, WILL RESULT IN FUEL CELL OVERHEATING WITH SUBSEQUENT RUPTURE AND/OR EXPLOSION/FIRE.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: J. Kimura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6